

XXIX. *An Account of an Occultation of the Star ζ Tauri by the Moon, observed at Leicester: By the Rev. Mr. Ludlam, in a Letter to the Rev. Mr. Maskelyne, Astronomer Royal.*

Reverend SIR,

Read June 4, 1770. **I** Here send you an account of the occultation of the star ζ Tauri by the moon, as we saw it at Leicester April 28, 1770. The necessary observations for examining the clock, are subjoined, which I think should always be done by those who have not fixed observatories; or where their instruments are not well adjusted at first, and frequently examined afterwards. Without being thus particular, no one can judge what degree of credit may be afforded to such observations; and it has, besides, this advantage, that if a mistake should be made in the calculations grounded on them, any person versed in Astronomy can rectify it.

I beg the favour of you to communicate this to the Royal Society; and am,

With the greatest respect,

Their and your most humble servant,

Leicester, April 29, 1770.

W. Ludlam.

The immersion was noted at $1x^h 41^m 7^s$ by the clock. I think it might be two seconds sooner, because the clock being of necessity at a distance from the telescope, the instant of the immersion was signified by striking upon a bell. The emersion was about $x^h 31'$ but with some uncertainty, the star being hid by a cloud at its first coming out.

By the observed transits of the sun and stars, the clock lost three seconds between the 25^{th} and 28^{th} . On the 25^{th} , by corresponding altitudes, the clock was $1' 46''$, 8 too slow; whence on the 28^{th} it was $1' 49''$, 8 too slow. This confirms the observation made by corresponding altitudes on the 28^{th} , by which it was $1' 50''$ too slow at noon: the clock was then losing at the rate of four seconds a day; whence, on the 28^{th} at $1x^h$, it was $1' 51''$, 5 slower than mean time. The equation of time on the 28^{th} at $1x^h$ was $2' 47''$, 5, whence the immersion was at $1x^h 45' 44''$ apparent time.

The Telescope made use of was one of Dollonds, with a triple object glass of $33\frac{1}{3}$ inches focal distance, and which magnifies 52 times.

Day of the month 1770	Transits Time by the clock Passage over					Object	Corresponding altitudes taken with an Hadley's quadrant of seven inches radius, by reflection from water.					
	First wire	Meridian		Third wire								
April 24	M S	H	M S	M S	} Sun	Sun April 25, 1770						
	53 54	XXII	54 42	55 27½		Double Alt. 65° Index err. + 1 ^m						
	56 6		56 53½	57 58		Time by the clock.						
						Eastern Az. Western Az. Meridian						
	26 7 36	X	8 21	9 5½		} Virginis	Up. limb Center Low. limb	VIII 21 48½ 23 42 25 37	III 30 43 28 52 26 54½	XI 56 15¾ 17 15¾		
	27 11 8	IX	11 55	12 41							} Leonis	Second fet. Doub. Alt. 67° 30'
	3 39	X	4 25	5 9½								
	17 28		18 24	19 9		} Spica V	Third fet. Doub. Alt. 70°					
	46 35		47 21	48 6½				} Sun	Up. limb Center Low. limb	VIII 39 53 41 50 43 48	III 12 34½ 10 41	XI 55 13¾ 15½
	53 24	XXIII	54 11	54 56½								
55 35		56 22	57 8	} Virginis	Cor. for ½ interval 3 ^h 20'							
28 7 9	IX	7 56	8 43			} Virginis	Passage over true meridian					
59 41	X	0 26½	1 11					} Spica V	Clock too slow			
13 30		14 25½	15 10	} Sun	Sun April 28, 1770							
42 36½		43 23	44 8			} Leonis	Double Alt. 79° 11' Index err. + 1 ^m					
53 10	XXIII	53 57½	54 44					} Sun	Time by the clock.			
55 21½		56 9	56 55	} Leonis	Eastern Az. Western Az. Meridian							
29 3 10½	IX	3 58	4 44			} Sun	Up. limb Center Low. limb			IX 8 12½ 10 16 12 22½	II 43 6½ 41 3 38 56	XI 55 39½ 39½ 38¾
53 0	XXIII	53 47	54 33½					} Sun	Mean			
55 13		56 0	56 46	} Leonis	Cor. for ½ interval 2 ^h 20'							
						} Sun	Passage over true meridian					
								} Leonis	Clock too slow			
				} Sun	Sun April 28, 1770							
						} Leonis	Double Alt. 79° 11' Index err. + 1 ^m					
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